Exxon Background Series

MIDDLE EAST OIL

EBS 8/76

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A background paper prepared by the Public Affairs Department of Exxon Corporation in cooperation with other Exxon departments and affiliates for Exxon and affiliate use.

A POSITION OF DOMINANCE

Crude oil reserves are the most impressive measure of the importance of the Middle East.* Recent published estimates put the region's proved reserves at about 400 billion barrels, 60 percent of the world total (See Charts 1 and 2 and Table 1) and its productive capacity at nearly half the world total.

It is this very fact of great oil productive capacity, based on vast proved reserves, plus the probability of huge undiscovered potential, which gives the Middle East region a pre-eminent position in any forecast of future oil supplies.

The emergence of the Middle East as the world's leading oil producing area is a comparatively recent development. Oil was discovered in Iran in commercial quantities as long ago as 1908, but it was not until after World War II that the region assumed its present dominant position as a source of supply. (See Chart 3)

The restoration and subsequent rapid expansion of war-shattered industry in Western Europe and Japan after World War II led to a tremendous increase in the demand for petroleum. The development of the oil industry in the Middle East was in direct response to that demand. Fields that had been discovered before the war were brought into production quickly, and intensive exploration soon uncovered large new oil fields.

From a production rate of 700,000 barrels a day (b/d), or less than one-tenth of the world's output in 1946, the region steadily assumed greater importance as a source of energy supply. By 1965, when production amounted to 9,700,000 b/d, the Middle East region had replaced the United States as the world's largest producer. In 1973 and 1974, oil production in the Middle East was approximately 23,000,000 b/d, about 40 percent of the worldwide total. In 1975, affected by the great price increases and worldwide recession, production dropped to about 21,000,000 b/d. (See Chart 4)

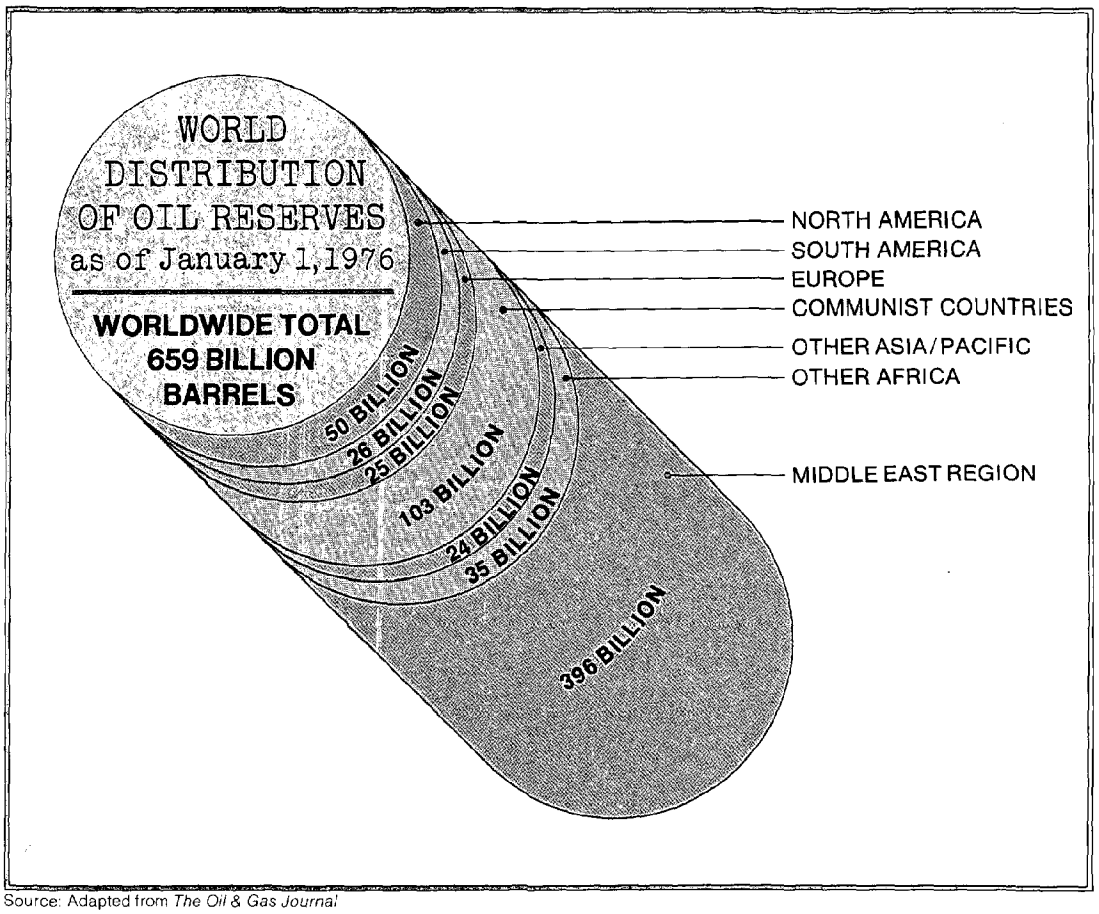
It is characteristic of the Middle East oil fields that the underground rock formations which form the reservoirs for crude oil have qualities permitting extremely high production rates for individual wells. In Iran, for instance, the average well produces about 12,600 b/d, compared to only 17 b/d in the United States. (See Table 2) The United States average is reduced by many small "stripper" wells, but even in one of the most prolific U.S. regions, the Gulf of Mexico off Louisiana, average per-well production is only 150 b/d. In contrast, there are wells in Iran regularly producing more than 50,000 b/d.

Producing costs in the Middle East, exclusive of payments to governments, are relatively low because of the high productivity of the fields and their proximity to deep water marine terminals. Despite the great distances to those places where Middle East oil is used, the construction of larger and larger tankers has reduced transportation costs in recent years.

The industrialized world, particularly Western Europe and Japan, is heavily dependent upon oil from the Middle East to fill its energy needs. The United States, which for years has obtained the bulk of its oil imports from Canada and Venezuela, now, too, gets an important—and growing—share from the Middle East. As recently as 1973, Canada and Venezuela together supplied about 40 percent of U.S. crude and product imports while the Middle East provided about 15 percent. By the third quarter of 1975, the two

*The term "Middle East" in this report refers to the countries surrounding the Gulf (the "Persian Gulf," as it is known in Western countries and Iran, but in Arab countries called the "Arabian Gulf"), plus Egypt and Libya.

CHART 1



Source: Adapted from *The Oil & Gas Journal*

regions were about even, Canada's and Venezuela's share having fallen—and the Middle East's having risen—to about 25 percent of a relatively unchanged imports rate of 6 million b/d.*

*Calculated from U.S. Bureau of Mines statistics, these data include only direct imports. They understate U.S. reliance on the Middle East because indeterminate volumes of products, credited to Caribbean countries where they were refined, were made from Middle East crudes. (During this period, Saudi Arabia's share of U.S. imports rose from 8 to 11 percent, placing it third behind Canada, down from 21 to 14 percent, and Nigeria, up from 7 to 12 percent. Venezuela, which had been second in 1973, fell to fourth as its share dropped from 18 to 10 percent.)

The Arab oil embargo during the winter of 1973-1974, and the fourfold increase in oil prices imposed by the Organization of Petroleum Exporting Countries (OPEC), served to focus attention on the extent to which the world was becoming dependent upon supplies of oil from the Middle East. The embargo was brought on by the Arab-Israeli war of October 1973, and tensions still exist. It seems almost inevitable that the dependence of energy consuming countries on oil from the Middle East will grow rather than diminish, with the result that political developments in that region could have an increasingly profound impact on world energy supplies.

FUNDAMENTAL CHANGES

Oil production is the preponderant source of the Middle East governments' total revenues—about 75 percent in Iran, and more than 90 percent in Saudi Arabia, Kuwait, and several others. (See Table 3)

In addition to direct government revenues from oil operations, the economies of the producing countries derive significant benefits from oil-related activities, such as purchases of goods and services from local merchants and contractors by oil companies and their employees, and the community development programs that the companies conduct.

As awareness of the economic significance of petroleum, their principal natural resource, has grown, governments of the Middle East have introduced measures aimed at obtaining the greatest possible benefit from it, now and in the future. They also have developed an increasing interest in having a greater working knowledge of the operations of the oil industry. The consequence of these trends is that the industry is operating in the Middle East today under business conditions that differ sharply from those of the past.

TABLE 1

MIDDLE EAST REGION OIL RESERVE AND DISCOVERY DATA
(Billions of barrels)

Country	*Cumulative Oil Produced As of 12/31/75*[1]	*Estimated Oil Reserves*			*Total Discoveries: (Reserves + Cum. Prodn.) 12/31/75*
		1950[2]	*1965*[3]	*1975*[3]	
BAHRAIN	0.6	0.3	0.2	0.3	0.9
IRAN	21.8	13.0	40.0	64.5	86.3
IRAQ	10.6	8.7	25.0	34.3	44.9
KUWAIT*	16.6	15.0	68.7	71.2	87.8
OMAN	0.9	—	0.5	5.9	6.8
QATAR	2.4	1.0	3.0	5.9	8.3
SAUDI ARABIA*	25.6	10.0	66.2	151.8	177.4
UNITED ARAB EMIRATES	3.7	—	10.0	32.2	35.9
TOTAL GULF AREA	82.2	48.0	213.6	366.1	448.3
EGYPT	1.2	0.2	2.0	3.9	5.1
LIBYA	9.0	—	10.0	26.1	35.1
TOTAL REGION	92.4	48.2	225.6	396.1	488.5
UNITED STATES	112.1	25.3	31.4	33.0	145.1

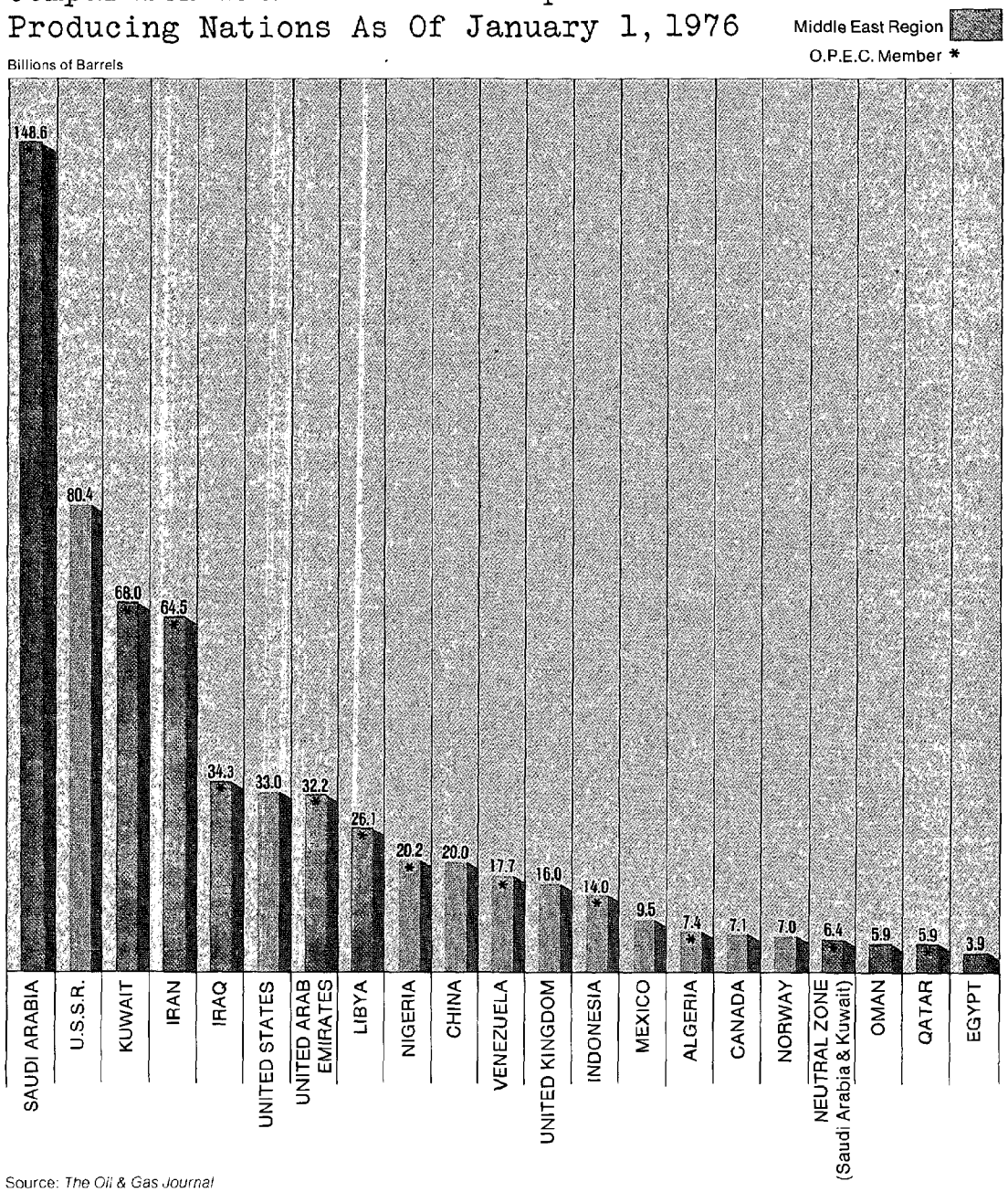
*Includes ½ of Neutral Zone
[1]Adapted from *The Oil & Gas Journal*
[2]*World Oil*
[3]*The Oil & Gas Journal*

Fundamental changes have occurred in the relationships between oil-producing countries, the international oil companies, and the consuming countries—and further change seems inevitable.

The original Middle East oil exploration and production concession agreements contained provisions that the governments were to receive from the companies an agreed fixed payment for each barrel of oil produced. In

CHART 2

PROVED CRUDE OIL RESERVES OF MIDDLE EAST NATIONS
Comparison with Other Principal Oil Producing Nations As Of January 1, 1976



Source: *The Oil & Gas Journal*

the early 1950s, that concept was changed, and in most producing countries profits from the sale of the oil thereafter were shared 50/50 by the companies and the host governments. (See Table 4)

In the early 1970s, after two decades of relative stability in royalties, taxes and oil prices, conditions became ripe for OPEC to begin to assert its underlying strength. Following negotiations in Tehran, Iran, between the OPEC governments and the oil companies, what was to be a five-year agreement was signed in February 1971. It increased the posted or "list" price of oil, raised tax rates, and boosted the government take for each barrel by more than one-third.

In September 1971 OPEC directed its members to "establish negotiations with the oil companies, either individually or in groups, with a view to achieving effective participation..." in their operations. Shortly thereafter, several governments of the Gulf area raised the issue of participation in ownership of oil and in December 1972, the oil companies concerned reached agreement on this question with representatives of the governments of Kuwait, Saudi Arabia, Abu Dhabi, and Qatar. It provided that the governments ultimately would achieve controlling ownership interest in the crude oil operations and facilities within their borders. Over a period of years, the level of government ownership would rise, and the companies would purchase a portion of the governments' share of the oil at a price reached by mutual agreement. It was agreed, also, that the companies would be compensated for unrecovered investments, "with due allowance for inflation that has occurred since the investments were made."

Perhaps the most fundamental change of all has been the manner in which crude oil prices are determined. Until 1973, free-market forces were the key element in determination of price levels; they reflected changes in supply and demand as well as changes in costs. When producing governments wanted to change the bases for determining their take in order to raise their revenues from oil, such changes were negotiated with the companies. Today, however, these governments establish the price of oil unilaterally at periodic meetings of OPEC. On October 1, 1975, the OPEC nations decreed their most recent increase—one of 10 percent, which brought the price of a barrel of Arab Light Crude to $11.51 or 27.4 cents per gallon. In 1970, the price of this same oil was about $1.40 per barrel, or 3.3 cents per gallon. (In May 1976, OPEC met again to consider oil prices, but did not raise them.)

As a result of the oil price increases, there has been a radical change in the level of producing-country revenues. While their per-barrel incomes grew modestly during the 1960s, by the end of 1975 they were approximately $11 per barrel—more than ten times what they had been in 1970. This, combined with increased volumes of production brought total Middle East government oil revenues in 1975 to about fourteen times the 1970 level. (See Charts 5 and 6)

On the other hand, average oil company profits from each barrel of Middle East oil production have been declining over the period. In 1975, they were generally less than 25 cents per barrel, compared to about 35 cents in mid-1973. (See Table 4)

HISTORY OF OPERATIONS

European countries became interested in Middle East oil long before the United States did, not only because the area was closer to them, but also because in the first half of this century the United States was more than self-sufficient in oil. Oil companies combined their resources in a number of joint ventures or partnerships in order to explore concessions. This was done to spread exploration risks and costs and to raise the large amounts of capital needed for operations in a region which was, at the time, extremely remote and presented difficult operating and living conditions.

The bulk of oil in the Middle East still is produced from portions of the original concession areas which were granted to major European and American oil firms prior to 1940. Since then, however, over one hundred companies have become active in Middle East oil operations. They have been granted concessions in Libya, in the offshore regions of several countries, and on relinquished portions of the original concession areas. They include 95 independent oil companies and 24 government oil entities. (See Table 5).

Iran

In Iran, the search began in 1901, when the country was known as Persia. That year William D'Arcy, an enterprising British oil hunter who had made a fortune in Australian gold mining, received from the ruler a concession that covered most of the country, except for five northern provinces. After seven years of arduous and fruitless explora-

TABLE 2

MIDDLE EAST REGION OIL PRODUCTION DATA

Country	*Oil Production 1000's barrels/day* 1950	1965	1975[1]	*Average 1975 1000's barrels/day* Productive[2] Capacity	Spare Capacity	*1975* Producing Oil Wells[1]	Daily Avg. Bbl./Well
BAHRAIN	30	60	61	70	9	202	300
IRAN	663	1,887	5,350	6,800	1,450	425	12,600
IRAQ	137	1,351	2,240	3,000	760	156	14,400
KUWAIT*	345	2,351	2,055	3,500	1,445	917	2,200
OMAN	–	–	342	400	58	208	1,600
QATAR	33	230	441	700	259	88	5,000
SAUDI ARABIA*	548	2,205	7,075	11,500	4,425	935	7,600
UNITED ARAB EMIRATES	–	282	1,695	2,340	645	273	6,200
TOTAL GULF AREA	1,756	8,366	19,259	28,310	9,051	3,204	6,000
EGYPT	45	123	230	250	20	319	700
LIBYA	–	1,219	1,488	2,500	1,012	851	1,700
TOTAL REGION	1,801	9,708	20,977	31,060	10,083	4,374	4,800
UNITED STATES	5,407	7,804	8,400	8,800	400	495,000	17

*Includes ½ of Neutral Zone
[1]*The Oil & Gas Journal*
[2]*Platt's Oilgram*

tion D'Arcy and his associates were about to abandon the search, when they finally discovered oil in commercial quantities near the head of the Gulf at Masjid-i-Suleiman. In 1909, the D'Arcy group formed Anglo-Persian Oil Company, Ltd., and the first shipments of oil from the Middle East were made in 1912 from Abadan, where a refinery had been completed in the same year.

In those early years, oil from Persia did not make a major impact on the world petroleum scene, although it was used to fuel some British naval and merchant ships operating east of Suez. But with the outbreak of World War I, Persian production assumed sudden importance as a secure source of fuel oil for the British Navy. At the urging of Sir Winston Churchill, then First Lord of the Admiralty, the British government in 1914 acquired a majority interest in the Anglo-Persian Oil Company. Production and refining capacity tripled during the war.

By 1938, after the country's name had been changed and Anglo-Persian had become the Anglo-Iranian Oil Company, production amounted to 215,000 b/d. (The company's name again was changed, to British Petroleum in 1954, in order to reflect its enlarged scope of operations.) Military needs became paramount again during World War II, and producing and refining facilities were enlarged further with the aid of American lend-lease funds.

Production in Iran expanded significantly after the conclusion of World War II, rising to more than 700,000 b/d at the beginning of 1951. That was nearly half of all Middle East production at the time. But operations were disrupted that year by the culmination of a prolonged dispute between the Anglo-Iranian Oil Company and the Government of Iran over a revision of concession terms.

A tentative agreement had been reached earlier, but it was rejected by the Iranian Majlis (Parliament) led by Premier Mohammed Mossadeq, and in March 1951, the Majlis nationalized the company. The National Iranian Oil Company (NIOC) was created to take over the nationalized properties and to handle oil operations, but these almost ground to a halt for lack of overseas markets.

After the Mossadeq regime was ousted by supporters of Shah Reza Pahlavi in August 1953, the U.S. government asked a group of American companies to join a consortium with British, French and Dutch interests. The consortium reached an agreement with the new Iranian government in October 1954, by which the consortium would conduct operations for, and share revenues with, NIOC. The original 100 percent British Petroleum concession ownership was reduced to a 40 percent holding in the consortium. American companies (five majors and a group of smaller companies) held another 40 percent, and the remaining 20 percent was divided between Compagnie Française des Pétroles and Royal Dutch Shell. Exxon Corporation has held a seven percent interest in the consortium since 1954.

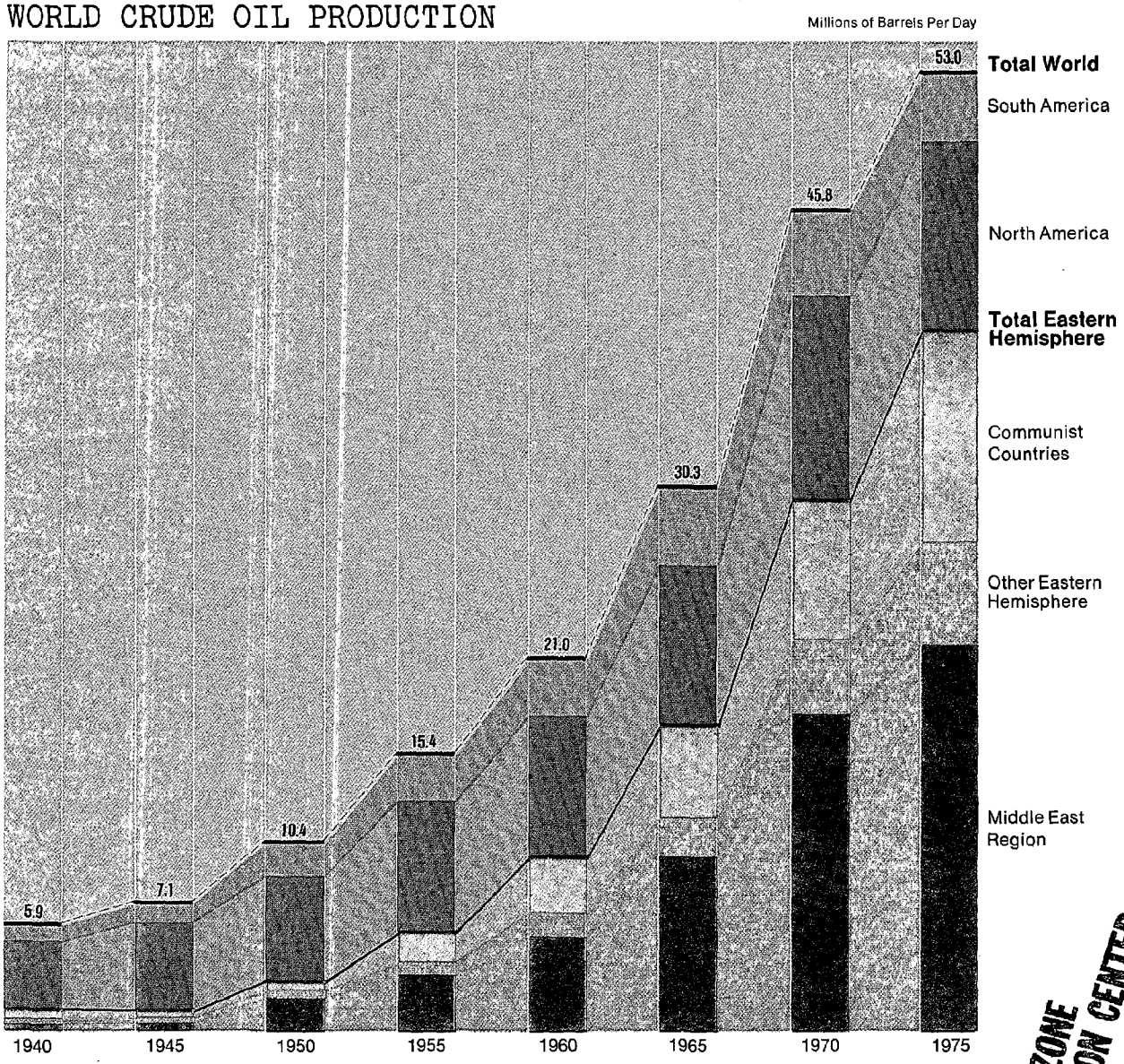
Production in Iran soared in the wake of the 1954 agreement, and Iran now ranks second among the major oil-exporting countries in the world. (See Chart 4)

Since 1957, NIOC has entered into agreements with a number of both private and government-owned companies of the United States, Europe, India and Japan. These agreements granted rights to explore and develop uncommitted territory, both onshore and in the Gulf, and were structured from the beginning as either 50/50 joint ventures with NIOC, or with the outside party acting as a contractor for NIOC.

In July 1973, the Iranian government and the consortium arrived at a new 20-year agreement to replace that of 1954 under which the consortium had been established. Under the new agreement, Iran assumed operational control of producing areas that it had owned since 1954, but which had been operated by the consortium, and the consortium established Oil Service Company, Iran (OSCO) to act as contractor for exploration

CHART 3

WORLD CRUDE OIL PRODUCTION



and producing activities in the agreement area. The consortium companies were given exclusive rights to purchase all the crude oil produced in this area, except quantities required for internal consumption and for export by NIOC. Although the provisions of the 1973 agreement differ in form from participation agreements between oil companies and other governments in the Gulf area, the net financial consequences for both sides are comparable. However, because of the great operating and fiscal changes which have occurred since it was written, the companies are seeking to modify the 1973 agreement.

Iran also exports large quantities of natural gas. In 1970, a major pipeline system was completed, designed to transport 800 million

TABLE 3

MIDDLE EAST REGION GEOGRAPHIC & OIL REVENUE DATA

Country	*Area: square miles*[1]	*Population: Millions 1975 est.*[1]	*Population Density per square mile*	*Government Revenue from Oil: Millions $ (est.)* *1950*	*1965*[2]	*1975*[3]	*Oil Revenue: $ per capita 1975*	*Oil Revenue as % of Total Govt. Revenue—1975 est.*
BAHRAIN	230	0.24	1,043	2	17	280	1,170	80
IRAN	636,000	34.35	54	45	522	19,900	580	75
IRAQ	168,000	10.77	64	30	375	7,600	705	85
KUWAIT*	7,800	0.99	127	12	671	7,900	7,980	90
OMAN	82,000	0.75	9	–	–	900	1,200	95+
QATAR	4,000	0.18	45	1	69	1,800	10,000	95+
SAUDI ARABIA*	873,000	7.01	8	110	655	26,700	3,810	95
UNITED ARAB EMIRATES	32,000	0.66	21	–	33	6,500	9,850	95+
TOTAL GULF AREA	1,803,030	54.95	30	200	2,342	71,580	1,300	–
EGYPT	387,000	36.42	94	2	40	700	20	10
LIBYA	680,000	2.35	3	–	371	5,200	2,210	95+
TOTAL REGION	2,870,030	93.72	33	202	2,753	78,080	830	–
UNITED STATES	3,615,000	214.30	59	not available		29,000[4]	135	7

*Includes ½ of Neutral Zone
[1]*World Almanac* and Census data
[2]*Petroleum Economist*
[3]U.S. Treasury Department, *Middle East Economic Digest,* Exxon estimates
[4]Federal plus State tax revenues—Exxon estimates

cubic feet per day of gas which is produced in association with oil. Most of this gas is delivered to the Soviet Union, and the rest goes to Tehran, the capital, and to other cities in Iran for industrial and residential use. Natural gas liquids, extracted from the gas to prepare it for pipeline delivery, are exported by consortium members.

As of 1975, more than 90 percent of Iran's production came from properties operated for NIOC by OSCO. The balance was from four of the newer offshore producing areas in the Gulf, held by non-consortium companies, plus a small amount produced inland by NIOC itself. During 1975, Iran's production averaged about 5.4 million b/d.

The oil produced by OSCO is about evenly divided between light crude, mainly from the Agha Jari and Marun fields, and medium crude, with principal sources in the Gach Saran and Ahwaz fields. All of the crude exported from the OSCO area is loaded at a single terminal located on Kharg Island in the Gulf. Other crudes, as well as products, are exported from terminals at Bandar Mar Shahr, Abadan, and Lavan Island.

Iraq

Competition among rival European entrepreneurs for oil exploration rights in Iraq began early in this century. After World War I,

the Turkish Petroleum Company, owned by British, French and Dutch interests and formed before the war, began exploration in northern Iraq. In the 1920s, the United States government urged the British and French governments to afford American companies "equality of commercial opportunity" in the Middle East. The American objective was to obtain exploration and producing rights in Iraq near discoveries that had been made in neighboring Iran.

In October 1927, during the course of the negotiations aimed at introducing an American interest into the company, oil was discovered in what was to become one of the great oil fields of the world—Kirkuk. This, of course, heightened American interest in the venture, and the following year an agreement was concluded under which a group of five American companies obtained an interest in the Turkish Petroleum Company. The company subsequently was renamed Iraq Petroleum Company (IPC). Three of the American companies later sold their interests, leaving Mobil and Exxon holding equal portions of the American share (23.75 percent) in IPC. The other shareholders were British Petroleum (23.75 percent), Shell (23.75 percent), Compagnie Française des Pétroles (23.75 percent) and the Gulbenkian interests (5.0 percent).*

Through the succeeding years, IPC's fields in northern Iraq accounted for the greater part of the country's oil exports. In 1932, Iraq granted a concession for the area west of the Tigris River and north of the thirty-third parallel to a company that subsequently sold its interest to the owners of IPC. After an extensive exploration effort, oil in commercial quantities was discovered at Ain Zalah in 1939, and later at Butmah. This operating company came to be called the Mosul Petroleum Company (MPC).

* Calouste S. Gulbenkian, one of the original owners of Turkish Petroleum, had negotiated with the government of the old Turkish Empire for the concession in Iraq.

In 1938, a third company, Basrah Petroleum Company (BPC), also owned by the IPC group, was granted a concession covering the southern part of Iraq. Basrah Petroleum Company began production in 1951 from the Zubair discovery, and later developed the Rumaila field.

Relations between oil-producing companies and the Iraq government became strained in the late 1950s. After several years of fruitless negotiations regarding acreage relinquishment, government participation in ownership and other issues, the situation came to a head in 1961. In December of that year, the government expropriated, without compensation, more than 99.5 percent of the total concession areas held by Iraq Petroleum and its associated companies, leaving the companies free to operate only in the limited areas where wells then were in actual production. Attempts to settle the dispute by arbitration, as provided in the concession agreement, were frustrated by the government's failure to name its arbitrator.

In July 1965, after two years of negotiations, the companies and Iraq's oil minister, with the approval of a ministerial committee set up for the purpose, reached a compromise agreement, including provision for a joint company/government exploration venture in the disputed areas. However, a political coup occurred, the new government failed to approve the agreement, and negotiations ceased. In 1967, the government assigned to the state-owned Iraq National Oil Company (INOC) exclusive rights to the expropriated acreage. Subsequently, INOC reached an agreement with a French government company, ERAP, under which the latter would explore and develop a portion of the area on a contract basis.

In June 1972, IPC operations in northern Iraq were nationalized. In February 1973, a settlement was negotiated, and IPC received compensation for its properties. At the same time, the Mosul company interests were relinquished because the owners were unable to meet the minimum production rate specified in the terms of the concession.

In October 1973, Iraq began nationalizing portions of Basrah Petroleum Co. Percentages corresponding to the interests of Exxon and Mobil Oil Corp., the Dutch 60 percent of Shell's interest, and the 5 percent share held by Gulbenkian's Participation and Exploration Company were successively taken. These actions closely followed the outbreak of Arab-Israeli hostilities, and were directed against companies whose home governments were considered by Iraq to be supporting Israel. In December 1975, Iraq reported that it had nationalized the British and French interests in BPC.

Iraq's production averaged over 2,200,000 b/d in 1975. In southern Iraq, the Basrah Petroleum Company's production averaged about 1,000,000 b/d from the southern portion of the Rumaila field. Export shipments are made from the offshore Khor-al-Amaya terminal at the northern tip of the Gulf. The government began production late in 1972 from the northern portion of the Rumaila field and in 1975 exported 140,000 b/d through the shallow-draft port of Fao on the Shatt-al-Arab River.

In the north, the government company produced over 1,000,000 b/d, primarily from the Kirkuk field. This oil is delivered by a 550-mile pipeline to eastern Mediterranean terminals in Syria and Lebanon, or by a new 500-mile pipeline recently completed, to terminals at Fao and Mina al Bakr.

Bahrain

The discovery of major reserves of oil in Iran and Iraq stimulated exploration elsewhere in the Middle East, including the island of Bahrain, 25 miles off the Gulf coast of Saudi Arabia. The Bahrain Petroleum Company, then a wholly-owned subsidiary of Standard Oil of California (Socal), struck oil with its first well in 1932. Four years later, Texaco became, and remains, a half-interest partner in Bahrain Petroleum Company. Bahrain's crude production (about 60,000 b/d) never has been a major factor in the Middle East total, but Bahrain Petroleum has constructed a large export refinery on the island for processing both local production and crude oil delivered by pipeline from Saudi Arabia.

Kuwait

The Kuwait Oil Company (KOC), owned in equal share by Gulf Oil Corporation and British Petroleum, obtained a concession in Kuwait in 1934. The prolific Burgan field was discovered in 1938, but development was suspended before production could begin because of World War II. As soon as the war ended, development of the field was resumed, and the first export shipment of crude oil was made in 1946.

In the 1970s, ownership of the Kuwaiti oil fields shifted from KOC to the government. After the Kuwait National Assembly failed to ratify the 1972 participation agreement, negotiations with the company led to a revised agreement that was ratified, providing for 60 percent government participation in KOC, effective January 1, 1974. In 1975, the government acquired a 100 percent interest in the KOC properties for a reported payment of $60 million.

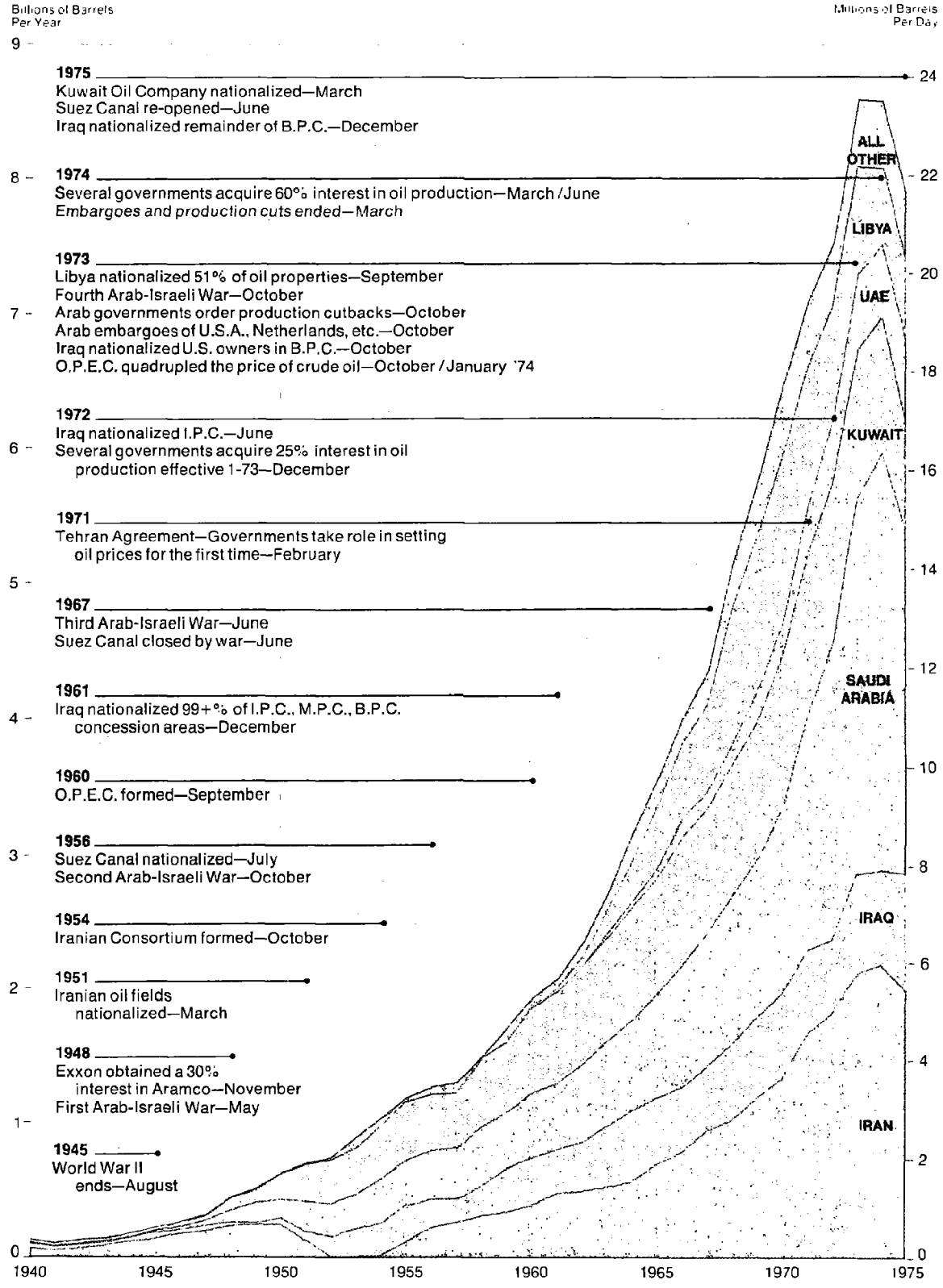
There now are seven oil fields in the KOC concession, including Burgan, one of the largest in the world. In 1975, production in Kuwait averaged 1,800,000 b/d, making it, despite its small land area (about the size of New Jersey), fourth among major exporting countries on the Gulf, surpassed only by Saudi Arabia, Iran and Iraq.

Saudi Arabia

Although sharing in the IPC ventures in Iraq and elsewhere in the Gulf gave American companies access to Middle East oil, it served to limit Exxon's activities in the area for

CHART 4

MIDDLE EAST REGION OIL PRODUCTION & CALENDAR OF SIGNIFICANT EVENTS



many years. The reason was that before the American companies obtained their interest in the Turkish Petroleum Company, the original owners had reached an agreement that none of the partners would act independently "directly or indirectly in the production...of crude oil" in the region that extends from what is now Turkey and Iraq to the southernmost extremity of the Arabian Peninsula. The objective of this agreement had been to help ensure that only the original companies, which had taken the initiative to explore in this new and difficult area, would participate in future developments in the vast, unexplored portions of the region. However, by 1948 this agreement ceased to be in effect.

The IPC group as a whole competed for concession rights in Saudi Arabia. It was outbid by Standard Oil of California (Socal), which was not in the IPC group and thus was free to act alone. In 1933, King Abdul Aziz ibn Saud granted that company a concession covering a large area in eastern and central Saudi Arabia. This later was extended offshore into the Gulf. Texaco joined Socal's venture in 1936. In 1938, the company, later to be named Arabian American Oil Company (Aramco), made the first important oil discovery in the nation, at Dammam.

The first Saudi Arabian crude was shipped in May 1939. World War II began in September of that year, and Aramco's operations gradually came to a halt. Shipping became difficult, there were tanker shortages, enemy action made markets inaccessible, and there was little demand for oil in the Indian Ocean area. Operations continued only to the extent needed to supply about 15,000 b/d to the refinery in Bahrain.

By the autumn of 1943, the United States government had become concerned that wartime petroleum requirements were creating a tremendous drain on American oil fields. The government decided to allocate the materials needed for a 50,000 b/d refinery at Ras Tanura on the Gulf coast of Saudi Arabia. Construction proceeded despite the many problems associated with a wartime project nearly half-way around the world from the sources of materials and equipment. The refinery was placed in operation in the fall of 1945, just as the war was ending.

In the immediate post-war period, further exploration in Saudi Arabia clearly indicated the huge potential of the area. There also was a need for a massive infusion of capital, men and equipment to develop that potential, and to find market outlets to absorb the growing production. The two original partners in Aramco were receptive to admitting other participants in their venture. At the same time, as the post-war demand for oil spurted, major international petroleum companies increasingly felt the need for new sources of crude. By 1948, Exxon and Mobil were free to seek an interest in the Aramco venture. Accordingly, they negotiated with Socal and Texaco, and each acquired an equity interest. Socal, Texaco and Exxon then owned 30 percent each, and Mobil 10 percent. In April 1975, Mobil agreed to increase its ownership of Aramco to 15 percent over a five-year period. At the end of that period, Exxon, Socal and Texaco each are expected to own 28⅓ percent.

Aramco's production increased rapidly, rising from about 500,000 b/d in 1949 to more than 3,000,000 b/d in 1969, and even more rapidly since. In 1975, the company's production averaged about 6,800,000 b/d of three major grades of crude oil: Arabian Light, Arabian Medium and Arabian Heavy. Of these, Arabian Light crude is by far the most important. The producing country governments have agreed that is the "marker" crude oil whose price is the standard to which prices for other OPEC crudes are related. The principal sources of this oil are the giant Ghawar and Abqaiq fields, which together stretch north and south for a distance of 170 miles in eastern Saudi Arabia. The Arabian Medium crude comes mainly from the smaller Khursaniyah field lying along the Gulf shore north of Abqaiq, and an offshore field called Zuluf. Arabian Heavy is produced from the offshore Safaniya and Manifa fields. Most of

TABLE 4

COST AND PROFITABILITY OF MIDDLE EAST OIL

Historical Data Illustrating Trends

	Year-End						
	1948	*1951*	*1960*	*1970*	*1973*[1]	*1974*	*1975*
PARTICIPATION, ROYALTY, TAXES							
Host Government Share of Production	0%	0%	0%	0%	25%	60%	60%
Host Government Royalty Rates	[2]	[2]	12½%	12½%	12½%	20%	20%
Host Government Tax Rates	0%	50%	50%	50%	55%	85%	85%
PRICES—*Dollars per barrel*							
Posted Price (i.e., list price)	2.05	1.75	1.80	1.80	2.90	11.25	12.40
Typical Sales Price	2.05	1.75	1.80	1.40	2.30	10.45	11.50
COSTS—*Dollars per barrel*							
Operating Cost (Explor. & Prod.)	(.60)	(.20)	(.20)	(.10)	(.15)	(.15)	(.25)
Host Government Take[3]	(.25)	(.75)	(.80)	(.95)	(1.80)	(10.10)	(11.00)
PROFITS—*Dollars per barrel*							
Oil Company Producing Profit Margin	1.20	.80	.80	.35	.35	.20	.25

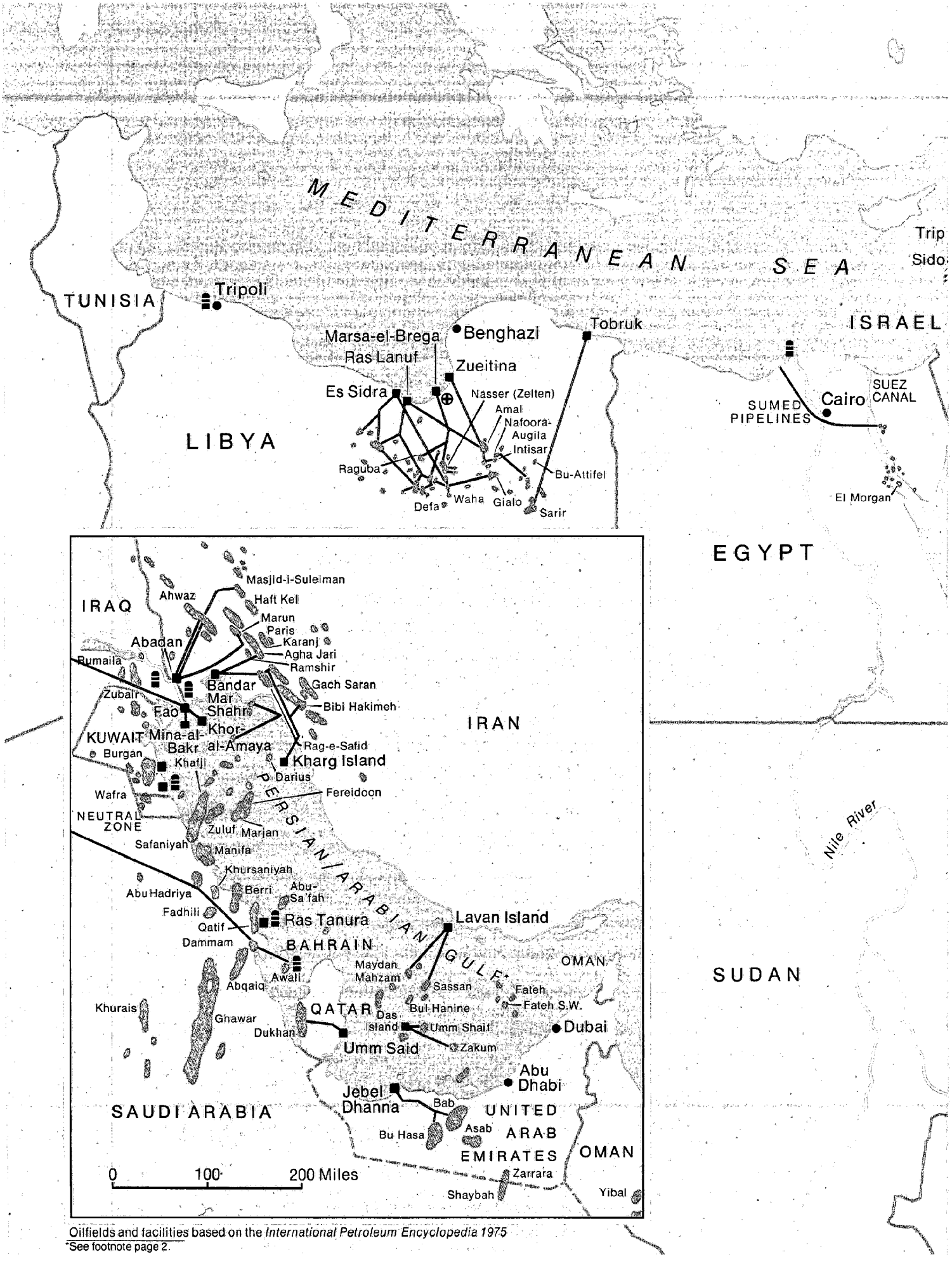
[1]June—prior to large price increases in October.
[2]Many original concession agreements called for a fixed payment in gold for each ton of oil exported. A ton of oil contains about 7½ barrels or 315 gallons.
[3]Includes royalties, taxes and other payments, but excludes receipts from sales of government-owned oil to non-concession holders (third parties).

the production is exported as crude oil in tankers loaded at Ras Tanura.

Utilization of natural gas produced in association with the crude oil is becoming increasingly important in Saudi Arabia. Aramco has installed facilities to extract over 300,000 b/d of liquids from the natural gas. The Saudi Arabian government has under way huge projects to collect, distribute and utilize the gas which is associated with Aramco oil production.

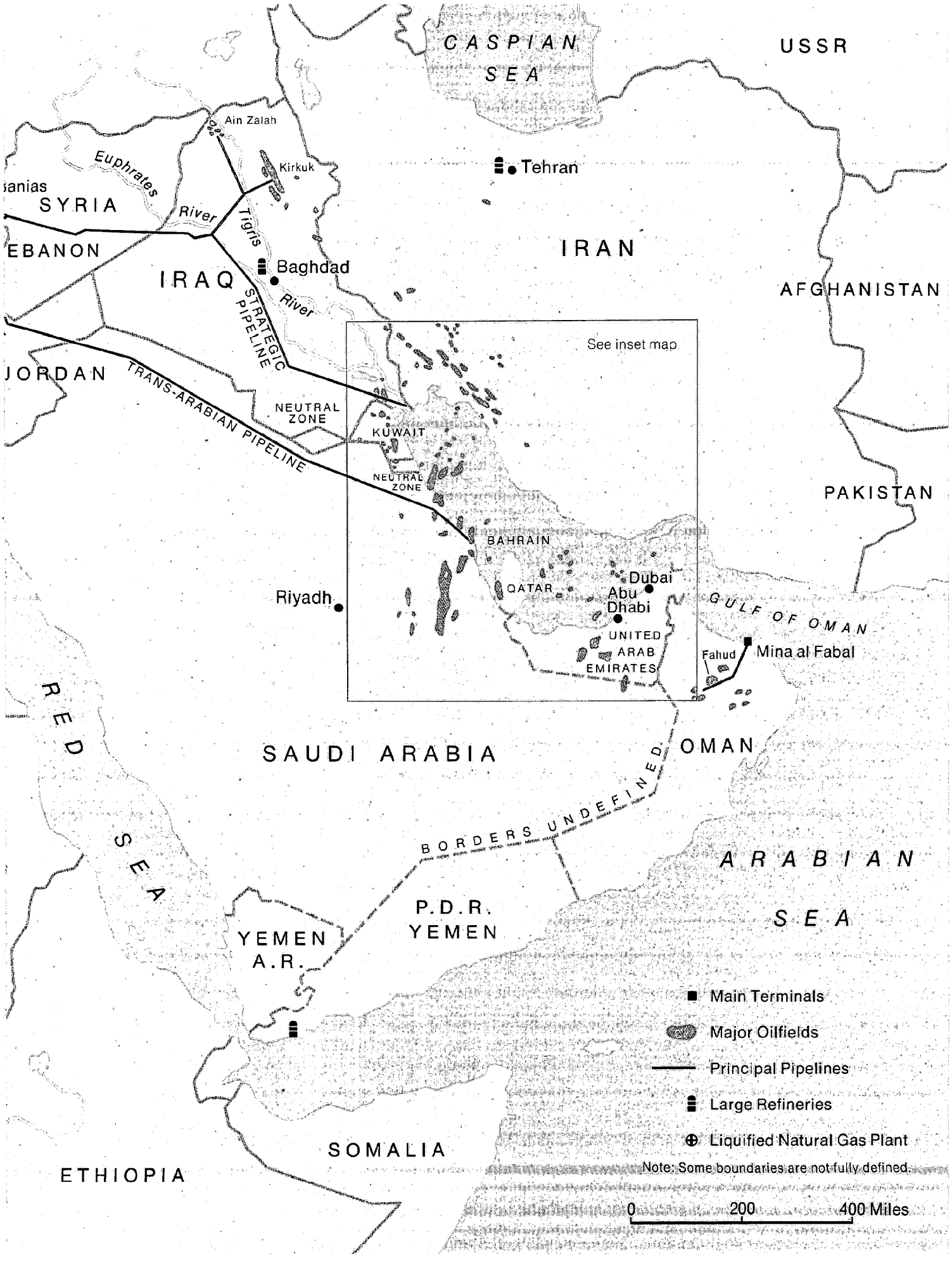
In 1950, the 30-inch-diameter Trans-Arabian Pipeline (Tapline) was completed. It extends from oil fields near the Gulf, across Saudi Arabia, Jordan and Syria, to a tanker terminal at Sidon on the Mediterranean coast in Lebanon. It was built to reduce transportation costs to Europe by eliminating the long haul around the Arabian Peninsula and through the Suez Canal. However, low tanker rates in 1975 made Tapline shipment uncompetitive with other oil routes and it has only been operating periodically at reduced levels.

The 1972 four-country participation agreement provided a 25-percent interest in the crude oil producing assets of Aramco for the Government of Saudi Arabia. A second agreement increased the government's interest to 60 percent, effective on January 1, 1974, but many important aspects of implementing this agreement were left for later negotiations. Then, in mid-1974, the government made known its desire to increase its interest to 100 percent. Since that time Aramco and the government have been negotiating the terms of the takeover. While the final terms have not yet been resolved, it is expected that Aramco will have a role in



Oilfields and facilities based on the *International Petroleum Encyclopedia 1975*

*See footnote page 2.


CASPIAN SEA
USSR
Ain Zalah
Kirkuk
Tehran
Euphrates River
Tigris River
SYRIA
LEBANON
IRAQ
Baghdad
IRAN
AFGHANISTAN
STRATEGIC PIPELINE
See inset map
JORDAN
TRANS-ARABIAN PIPELINE
NEUTRAL ZONE
KUWAIT
NEUTRAL ZONE
PAKISTAN
BAHRAIN
Dubai
Abu Dhabi
QATAR
Riyadh
GULF OF OMAN
UNITED ARAB EMIRATES
Fahud
Mina al Fabal
RED SEA
SAUDI ARABIA
OMAN
BORDERS UNDEFINED
ARABIAN SEA
P.D.R. YEMEN
YEMEN A.R.
SOMALIA
ETHIOPIA
Main Terminals
Major Oilfields
Principal Pipelines
Large Refineries
Liquified Natural Gas Plant
Note: Some boundaries are not fully defined.
0
200
400 Miles

operating the oil fields for the government, and will have access to substantial volumes of Saudi crude oil.

Saudi Arabia/Kuwait Neutral Zone
A disputed area of some 5,700 square miles between Saudi Arabia and Kuwait was designated as the Kuwait/Saudi Arabia Neutral Zone in 1922. In 1971, the zone was divided geographically for administrative purposes, with Kuwait and Saudi Arabia taking responsibility for the northern and southern portions, respectively.

Concessions in the Zone have been granted to three different companies, each operating independently. Kuwait granted its onshore rights to the American Independent Oil Company (Aminoil) in 1948, and Saudi Arabia's onshore rights are held in a concession granted in 1949 to the Getty Oil Company. The rights to the entire Neutral Zone offshore area were acquired in 1958 from both countries by the Arabian Oil Company (A.O.C.), a Japanese firm. In 1975, A.O.C. produced approximately 325,000 b/d from the Hout and Khafji fields. The latter is an extension of Aramco's Safaniya field. Onshore, Aminoil and Getty produced 170,000 b/d from the Wafra field.

Qatar
Qatar (pronounced like "gutter") occupies a peninsula jutting northward into the Gulf from its southern coastline. A 75-year onshore concession was obtained in 1935 by Qatar Petroleum Company (QPC), another in the IPC group of companies.

QPC discovered the Dukhan field in 1940 and, after a war-imposed delay, began production in 1949. Output averaged about 175,000 b/d in 1975, but by year-end was nearly 300,000 b/d as the oil companies sought to replace the oil lost by nationalization in southern Iraq.

The offshore areas of Qatar are under concession to Shell, and production there from the Idd El Shargi, Maydan-Mahzam and Bul Hanine fields, all discoveries made since 1960, averaged 260,000 b/d in 1975.

A 60-percent participation agreement between the operating companies and the Government of Qatar became effective in 1974, and the government has expressed its intent to increase this interest to 100 percent.

Abu Dhabi
Abu Dhabi is one of seven Arab States on the southeastern Trucial Coast of the Gulf, joined together in a federation called the United Arab Emirates. In 1939, the Ruler of Abu Dhabi granted a 75-year concession covering all his land area, coastal waters, and islands in the Gulf to the Abu Dhabi Petroleum Company (ADPC), owned by the IPC group of companies.

The war in Europe and boundary disputes with Saudi Arabia precluded any intensive exploration and development efforts until 1950. It was not until 1960 that oil was found in commercial quantities, and three years later exports began. A participation agreement, giving Abu Dhabi a 60-percent interest in ADPC, became effective in 1974, and the government has said it currently has no desire to increase its share of participation above this level.

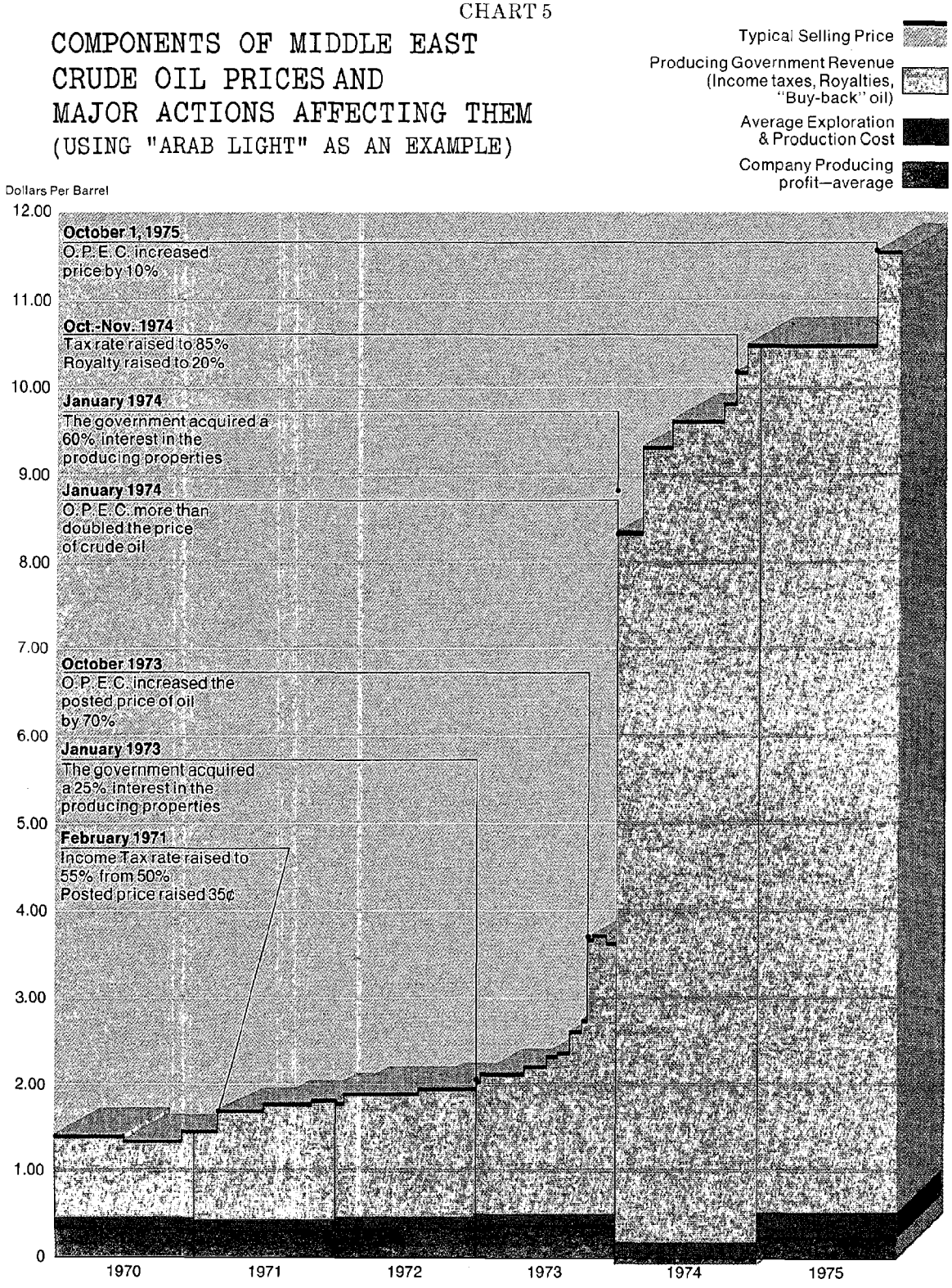
A concession covering offshore rights apart from the islands and coastal waters was granted in 1953 to Abu Dhabi Marine Areas, Ltd. (ADMA), a company owned by British Petroleum and Compagnie Française des Pétroles. Oil was discovered in this concession in 1958 and exports began in 1962.

In the 15 years since commercial production was established, output has increased rapidly, and Abu Dhabi ranks fifth among the Middle East's crude exporting countries. ADPC produced an average of about 900,000 b/d during 1975 from its onshore acreage. This production comes largely from the Bu Hasa, Asab and Murban fields located east and southeast of the marine terminal at Jebel Dhanna.

CHART 5

COMPONENTS OF MIDDLE EAST CRUDE OIL PRICES AND MAJOR ACTIONS AFFECTING THEM

(USING "ARAB LIGHT" AS AN EXAMPLE)



Abu Dhabi Marine Areas, Ltd. (ADMA) produced over 400,000 b/d during 1975 from two offshore fields, Zakum and Umm Shaif. The oil is pumped through underwater pipelines to a terminal on Das Island.

Another offshore concession is held by Abu Dhabi Oil Company (ADOC), owned by three Japanese companies. It began production from the Mubarraz field in 1974, and 1975 production is estimated to have been about 20,000 b/d.

Libya

In the 1960s, Libya made the dramatic transition from a nation with few resources to one with major production of oil and gas. After reaching a peak of 3,700,000 b/d in April 1970, Libya's oil production has declined to an average of less than 1,500,000 b/d in 1975, largely because of depletion of older fields and government-imposed conservation measures.

TABLE 5

Number of Companies with Active Exploration and/or Producing Interests in the Middle East Region

Category of Company	*1940*	*1950*	*1960*	*1970*	*1976*
Major Oil Companies	7	7	7	7	7
Independent Oil Companies					
U.S. Independents	0	10	22	36	46
Non-U.S. Independents	2	2	9	34	49
Government Oil Entities	0	0	3	15	24
Total	9	19	41	92	126

Sources:
Multinational Corporations and U.S. Foreign Policy, Hearings before the Subcommittee on Multinational Corporations, U.S. Senate Committee on Foreign Relations, March 28, 1974, p. 345. SOCAL presentation
Bulletins of The American Association of Petroleum Geologists
Petroleum Economist, June 1976

When Libya was opened for oil exploration in the 1950s, concessions were acquired by a number of American companies that were newcomers to overseas operations, as well as by major international companies already active in the Middle East. By 1970, interests in Libyan production were held by 21 companies. Among them were Continental, Marathon, Occidental, Amerada Hess, W. R. Grace, Phillips, and American Oil Company (Amoco), as well as Exxon, Mobil, Socal, Texaco, British Petroleum, and Shell.

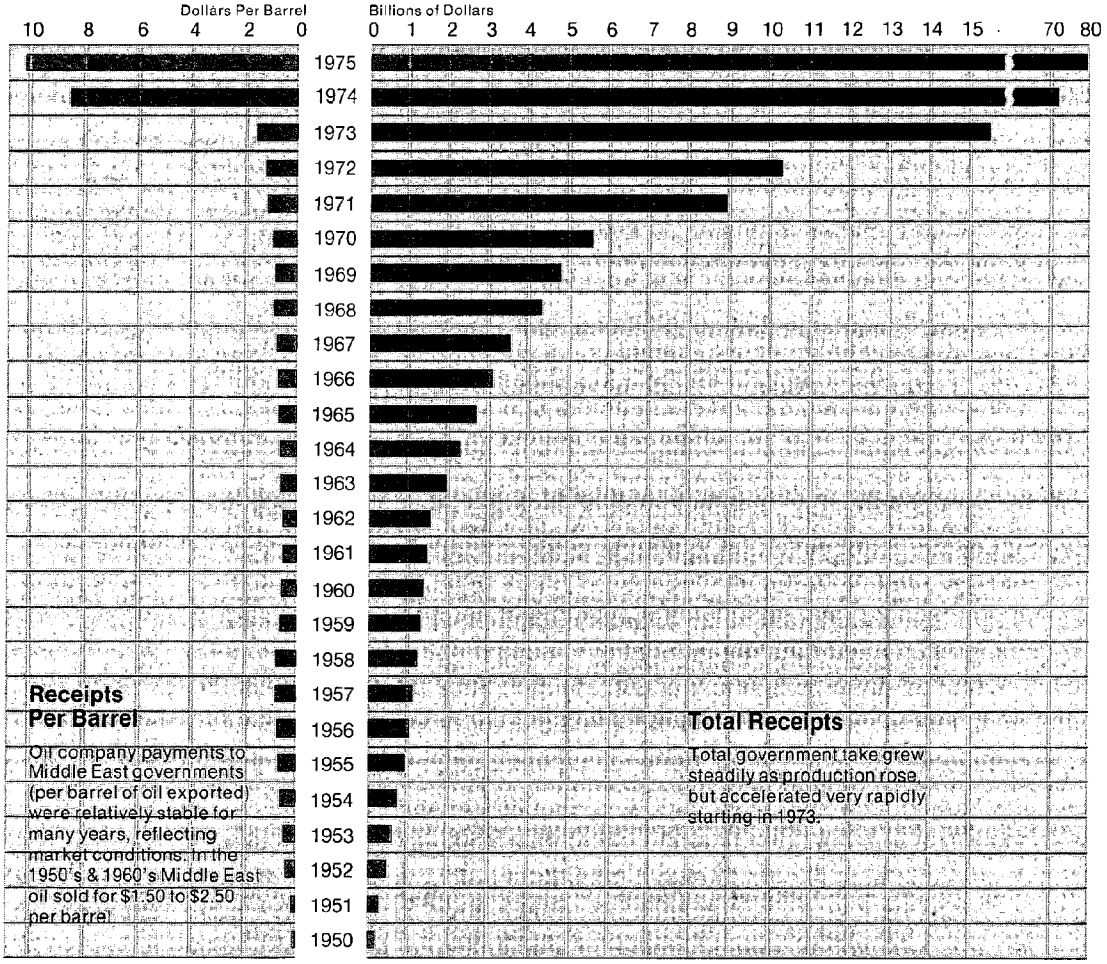
In 1955 and 1956, Exxon was granted concession rights to almost 38,600 square miles, and in 1957, the company drilled the first oil discovery well in Libya. With a flow of 500 b/d, it would have been an attractive commercial discovery in many parts of the world, but at a remote desert location on Libya's western border, 400 miles from the Mediterranean coast, it was considered too small to be commercially viable. By the end of 1958 the oil industry had spent about $100 million in the Libyan search, with nothing to show for it but a string of dry or non-commercial wells. However, in April 1959, after drilling for 113 days at a location near Bir Zelten in north central Libya, Exxon struck oil in commercial quantities.

Promising as the Zelten field (now renamed Nasser by the government) appeared to be, it also was remote from any port. The next task was to build a pipeline across the desert, as well as the terminal and tanker facilities needed to export Zelten oil. Three years later, on September 12, 1961, at the newly constructed port of Marsa el Brega on the Mediterranean. Exxon loaded a tanker with the first oil to be shipped from Libya. Production from Exxon's concessions reached a peak of 670,000 b/d in 1968 and 1969.

Along with the oil, there was associated gas production. Facilities were constructed to transport gas 100 miles to the coast by pipeline, cool it to 260° below zero Fahrenheit in order to liquefy it, ship the liquefied gas by

CHART 6

MIDDLE EAST REGION – GOVERNMENT TAKE FROM OIL



refrigerated tankers across the Mediterranean to Europe, and there to regasify it for use by customers. The total cost of this project was about $400 million, of which Exxon's share was about $230 million. The system, started in 1969, has the capacity to supply 345 million cubic feet of gas a day to customers in Spain and Italy, and to produce 25,000 b/d of natural gas liquids.

After a long series of negotiations, during which the companies attempted to reach agreement compatible with the terms agreed upon with other countries, the Libyan government nationalized all or part of each of the companies operating there. For Exxon, the nationalization occurred in September 1973, when the government took over 51 percent of its affiliate's oil field operations. Some of the companies, including Exxon, later worked out agreements for continuing operations in existing areas, and for acquiring new acreage, including, for the first time, offshore areas in the Mediterranean Sea.

Egypt

Centuries ago, oil seepages at Gebel el Zeit, near the mouth of the Gulf of Suez, earned that ridge the Roman name Mons Petroleus, but the first commercial oil well was not drilled until 1909.

In 1937, the government provided a great impetus to exploration by relaxing the highly restrictive regulations then in force and many companies, including Exxon, applied for exploration permits. In 1949, after 12 years of exploration work and the expenditure of about $16 million, Exxon discontinued its exploration activities in Egypt when unfavorable legislation was enacted.

A decade later, Egypt again sought to encourage foreign oil investment, and in 1963 signed agreements with several foreign oil companies. A number of new fields were discovered, but as they were being developed, several of them came under the control of Israeli occupying forces starting in 1967 and lasting to the end of 1975. In the interim, Egypt asked for bids on new exploration acreage in 1973, and Exxon was one of the successful contenders, reaching agreement for exploration and possible development of tracts offshore in the Mediterranean near the Nile Delta and in the Red Sea.

From a level of about 100,000 b/d in 1966, Egyptian production grew to a peak of 400,000 b/d in 1970 and 1971 (including about 100,000 b/d under Israeli control). The Sinai war caused output to decline to about 250,000 b/d in 1973 and 1974, but by early 1976, when control of all the Sinai fields had been returned to Egypt, output had risen above 300,000 b/d. The government expects that by 1980 Egyptian production will rise to a level of about one million b/d.

Egypt's Suez Canal played an important role for many years in the international oil trade. Until its closure following the 1967 Arab-Israeli hostilities, the canal was a major artery for the shipment of oil from the Middle East to Western Europe and other markets. A round-trip voyage from the Gulf to Europe or North America is about 9,500 miles longer around Africa's Cape of Good Hope than via the Suez Canal. Very Large Crude Carriers (VLCCs), many of which have been built since 1967, cannot transit the canal, but it is economically attractive for smaller tankers and other vessels. After a period of clearing and reclamation, the canal was reopened on June 5, 1975. (See Chart 7)

Construction has started on twin 42-inch Suez-Mediterranean (SUMED) pipelines, scheduled to have an initial capacity of 1,600,000 b/d. VLCCs are to be used to deliver crude oil to a Gulf of Suez terminus, and the pipelines are to carry it to other VLCCs at the Mediterranean end.

Other Countries

Since World War II, discoveries have been made and oil production initiated in several other parts of the Gulf area. In Oman, on the easternmost tip of the Arabian Peninsula, and about 150 miles inland from the coast, oil was discovered in the early 1960s, and after construction of a pipeline, production began in 1967. In 1975, output averaged about 340,000 b/d. Among the newer producing areas, Dubai on the Trucial Coast attained an output of 250,000 b/d in 1975 from offshore fields. Dubai is a member of the United Arab Emirates. Another of these, Sharjah, produces about 40,000 b/d from an offshore field discovered in 1972.

Refining and Other Activities

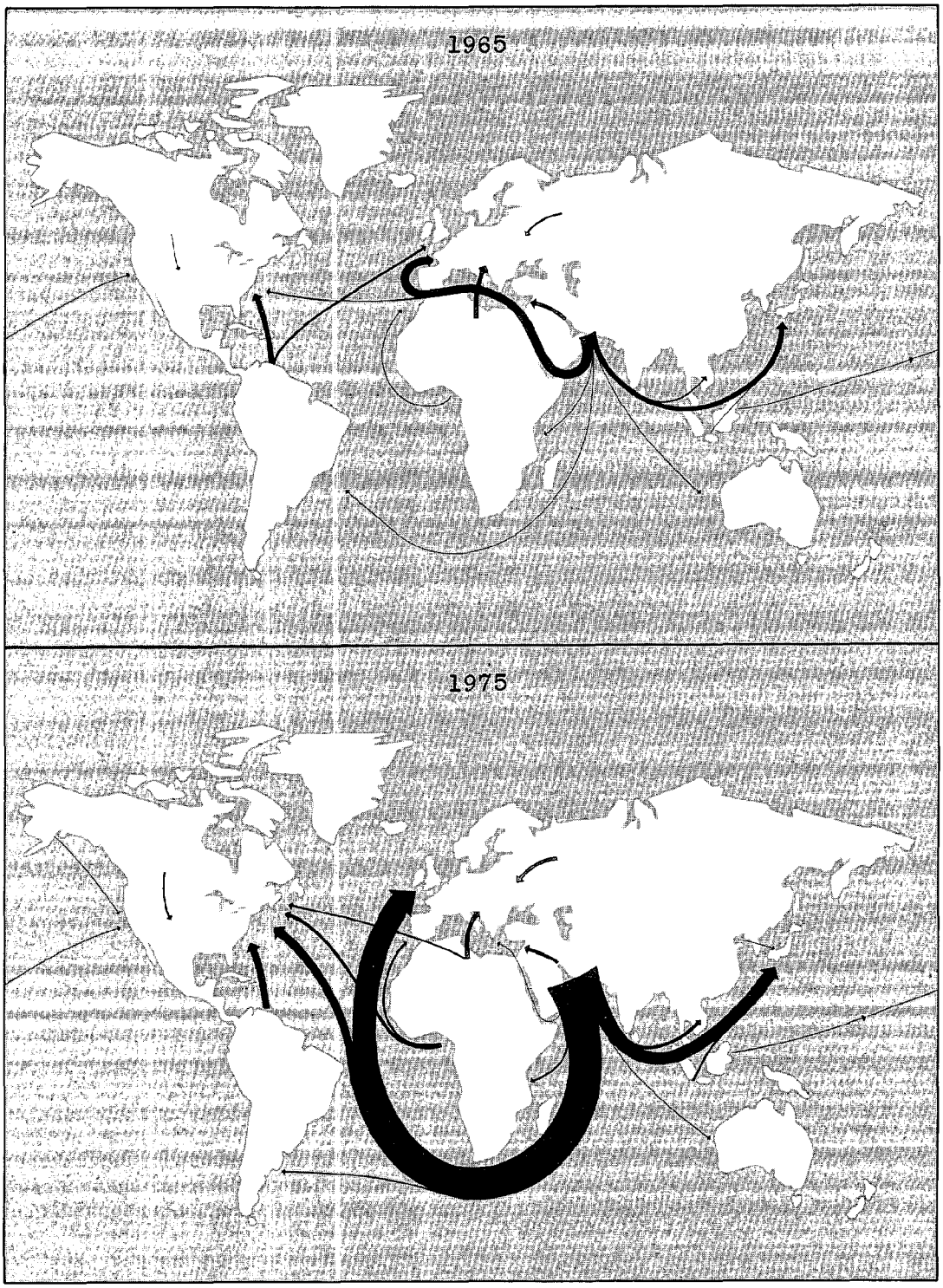
Although dwarfed by oil producing and exporting operations, refining and natural gas processing in the Middle East are substantial.

Refineries in the area can process more than 3,000,000 b/d. Output of the refineries is marketed principally in the Middle East, in East Africa, and in Southeast Asia.

Increasing use is being made of the gas produced in association with crude oil. In the Gulf area, there are a number of facilities for extracting liquefied petroleum gas and natural gasoline from this gas, and many more are planned.

CHART 7

PRINCIPAL INTERNATIONAL OIL MOVEMENTS



Exports from the Middle East region expanded rapidly as world oil consumption grew. The widths of the arrows in the maps above are proportional to the volumes of crude oil and petroleum products moved in international trade. The patterns changed significantly when the Suez Canal was closed to shipping in 1967.

TABLE 6

LARGE MIDDLE EAST OIL FIELDS

(Data as of Mid-Year 1975)

Source: Adapted from *The Oil & Gas Journal*, Dec. 29, 1975

Date of Discovery	*Oil field Name*	*Operating Company*	*Production*		*Number of Producing Wells*	*Oil Gravity °A.P.I.*
			Daily (1000's b/d)	*Cumulative (Million bbl.)*		
BAHRAIN						
1932	Awali	Bahrain Pet. Co.	63	580	202	33
EGYPT						
1965	El Morgan*	GUPCO (AMOCO/Govt.)	81	457	24	27-32
IRAN						
1936	Agha Jari	OSCO (Consortium)	800	6,047	50	34
1958	Ahwaz	OSCO	1,052	1,625	42	24-32
1961	Bibi Hakimeh	OSCO	310	1,171	22	30
1961	Darius*	IPAC	88	342	12	34
1937	Gach Saran	OSCO	808	3,612	34	31
1927	Haft Kel	OSCO	28	1,676	12	38
1963	Karanj	OSCO	195	565	7	34
1963	Marun	OSCO	1,152	2,402	37	33
1908	Masjid-i Suleiman	OSCO	11	1,354	37	40
1964	Paris	OSCO	130	635	9	34
1964	Rag-e-Safid	OSCO	240	298	14	29
1966	Sassan*	LAPCO	179	382	19	34
IRAQ						
1927	Kirkuk	Iraq Nat'l Oil Co. (formerly Iraq Petroleum Co.)	959	6,757	45	36
1953	Rumaila	BPC/INOC	950	2,340	60	34-35
1949	Zubair	Basrah Petroleum Co.	200	739	33	34
KUWAIT						
1938	Burgan	Kuwait Oil Co.	NA	NA	374	31-32
LIBYA						
1959	Amal	Mobil	51	493	81	36
1968	Bu-Attifel	AGIP	84	117	24	41
1969	Defa	Oasis Oil Co.	117	364	60	36
1961	Gialo	Oasis Oil Co.	118	1,133	156	36
1967	Intisar A	Occidental Pet. Co.	67	515	12	45
1967	Intisar D	Occidental Pet. Co.	138	549	18	40
1965	Nafoora-Augila	Govt. (formerly Amoseas)	51	533	28	36
1959	Nasser (Zelten)	Exxon	90	1,709	130	38
1961	Raguba	Exxon	44	418	40	43
1961	Sarir	Govt. (formerly BP/Hunt)	175	857	68	37
1960	Waha	Oasis Oil Co.	72	543	46	36

*Offshore or partly offshore

TABLE 6 (continued)

LARGE MIDDLE EAST OIL FIELDS

(Data as of Mid-Year 1975)
Source: Adapted from *The Oil & Gas Journal*, Dec. 29, 1975

Date of Discovery	*Oil field Name*	*Operating Company*	*Production*		*Number of Producing Wells*	*Oil Gravity °A.P.I.*
			Daily (1000's b/d)	*Cumulative (Million bbl.)*		
NEUTRAL ZONE						
1953	Wafra	Aminoil/Getty	118	883	296	19-24
1961	Khafji*[1]	Arabian Oil Co.	273	1,251	106	28
OMAN						
1964	Fahud	Pet. Dev. (OMAN)	105	434	76	33
1962	Yibal	Pet. Dev. (OMAN)	92	131	65	40
QATAR						
1970	Bul Hanine*	Shell Co. of Qatar	145	148	6	35
1940	Dukhan	Qatar Petroleum Co.	172	1,532	56	41
1963	Maydan Mahzam*	Shell Co. of Qatar	122	422	11	38
SAUDI ARABIA						
1940	Abqaiq	Aramco	763	4,915	60	38
1940	Abu-Hadriyah	Aramco	49	307	8	35
1963	Abu-Sa'fah*	Aramco	60	260	14	30
1964	Berri*	Aramco	334	792	45	33-38
1938	Dammam	Aramco	18	541	18	34
1948	Ghawar	Aramco	4,205	11,638	391	35
1956	Khursaniyah	Aramco	55	483	14	31
1945	Qatif*	Aramco	66	463	21	31
1951	Safaniyah*[1]	Aramco	827	3,176	92	27
1965	Zuluf*	Aramco	82	142	12	32
UNITED ARAB EMIRATES						
1965	Asab	Abu Dhabi Pet. Co.	246	134	32	38-40
1962	BuHasa	Abu Dhabi Pet. Co.	428	1,149	49	38-40
1966	Fateh*	Dubai Marine Areas, Ltd.	149	254	36	32
1970	Southwest Fateh*	Dubai Marine Areas, Ltd.	103	97	18	33
1958	Umm Shaif*	Abu Dhabi Marine Areas, Ltd.	162	513	36	38
1964	Zakum*	Abu Dhabi Marine Areas, Ltd.	224	619	46	40
			1,100	4,427	198	27-28

*Offshore or partly offshore
[1]Note: Safaniyah/Khafji Combined reservoir

RECENT DEVELOPMENTS

An understanding of the recent major changes in the relationships between oil companies and the producing countries of the Middle East requires an historical perspective.

As mentioned earlier, when the first concession agreements were negotiated, it was the custom to pay the host government a fixed annual rental until oil was discovered and then a royalty for each barrel of oil produced. These fixed payments provided the governments with an income irrespective of the profitability of the venture. In the early 1950s, per-barrel royalties were supplemented by a 50/50 profit-sharing concept.

Through most of that decade, the producing country governments were satisfied with payments they received under the 50/50 arrangement. Production rose sharply year after year. In addition, government revenues per barrel increased as a result of declining production costs, augmented by a general increase in the oil companies' posted prices in 1957. But the situation changed abruptly early in 1959 when, to meet market competition, the companies reduced posted prices. Another drop in posted prices came in the fall of 1960, again in response to market forces.

The governments of the producing nations expressed alarm over the price reductions, which reduced their per barrel oil revenues. In 1960 the governments' per barrel revenues averaged 78 cents, compared to 80 cents in the previous year and a high of 86 cents in 1957. However, total government revenues increased each year during the same period because of the growing volume of exports. (See Chart 6)

The Birth of OPEC

In September 1960, government oil officials of Saudi Arabia, Venezuela, Iran, Iraq and Kuwait met in Baghdad, Iraq. Two principal resolutions were adopted at that meeting:

> The first stated that the five producing countries could "no longer be indifferent to the attitude adopted by the oil companies in effecting (posted) price modifications," demanded that the oil companies "maintain their prices steady and free from all unnecessary fluctuations," and declared their intention to "study and formulate a system to ensure the stabilization of prices by, among other means, the regulation of producing..."

> The second resolution advised that the "Conference decided to form a permanent organization called the Organization of Petroleum Exporting Countries...," and that "the principal aim of the organization shall be the unification of petroleum policies for the member countries and the determination of the best means for safeguarding the interests of member countries, individually and collectively."

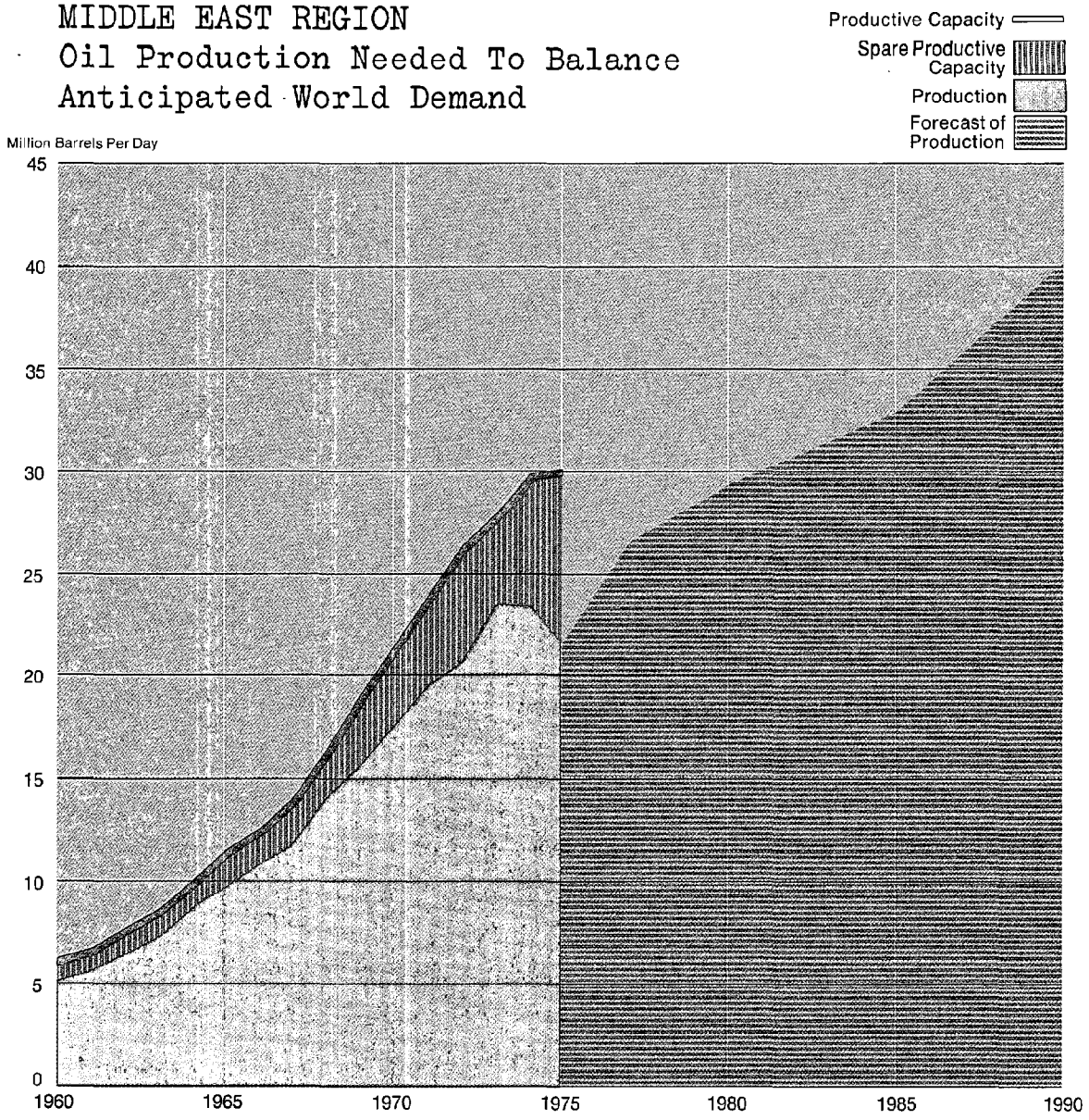
With approval of the resolutions later that year by each of the respective governments, the Organization of Petroleum Exporting Countries (OPEC) officially came into being.

During its first ten years, OPEC expanded its membership, with new countries being added in this sequence: Qatar in 1961, Indonesia and Libya in 1962, Abu Dhabi in 1967, Algeria in 1969, Nigeria in 1971, and Ecuador in 1973. Gabon became an associate member in 1973 and a full member in 1975.

In its early days, OPEC's principal objective was to insulate its members' per barrel revenues (government take) from the general depression in crude oil market prices that occurred during the 1960s. The cohesion demonstrated by OPEC gave strength to the countries' position that posted prices for crude oil should be held stable in this period of declining market prices. OPEC also was in-

CHART 8

MIDDLE EAST REGION
Oil Production Needed To Balance Anticipated World Demand



strumental in effecting certain changes in the basis for the computation of producing country revenues. The most important of these, which increased government revenues by about five cents per barrel, was to treat the 12.5 percent royalty payments as an item of expense, rather than a tax credit when calculating income tax payments.

As a result of these changes and continued declines in operating costs, even though the companies' posted prices remained unchanged, average per barrel revenues to Middle East countries rose from 78 cents in 1960 to 85 cents in 1968. (See Chart 6) By 1970, OPEC was in a strong position to demand sharply increased oil revenues from

the companies. Several circumstances had combined to shift the balance of negotiating power in favor of the producing countries: an unexpected surge in world oil demand, a rupture and close-down of Tapline for most of 1970, production cutbacks ordered by Libya, and a tight transportation situation brought about by these events and the closed Suez Canal.

After extensive negotiations, new price and tax agreements were reached late in 1970 and early in 1971 between the oil companies and the major producing countries of the Gulf area and Libya. The agreements provided increases of from 20 to 35 percent in the posted prices of crude oils, and subsequent annual escalations to reflect inflation. Combined with higher tax rates and other provisions, this meant immediate revenue increases to the governments of from 30 to 50 percent.

The 1971 agreements marked the first time that Middle East posted prices had been established by negotiation between the oil companies and several of the producing governments as a group. The terms were supposed to remain in effect for approximately five years. But they did not.

A New Concept of Oil Pricing

In the fall of 1973, the Gulf producing members of OPEC became dissatisfied with the 1971 price and tax agreements, although these had been modified as recently as the spring of that year to reflect currency changes and inflation.

The countries sought to revise the 1971 agreements and, after a brief abortive negotiating session with the oil companies, on October 16, 1973, decreed unilaterally an increase of about 70 percent in the posted prices for their crude oil. Shortly thereafter, they met again and once more raised posted prices, effective January 1, 1974, this time to a level about four times what they had been just three months earlier. These events roughly coincided with the outbreak of the October Arab/Israeli war and the subsequent embargo of oil shipments from Arab States to the United States, the Netherlands and several other countries.

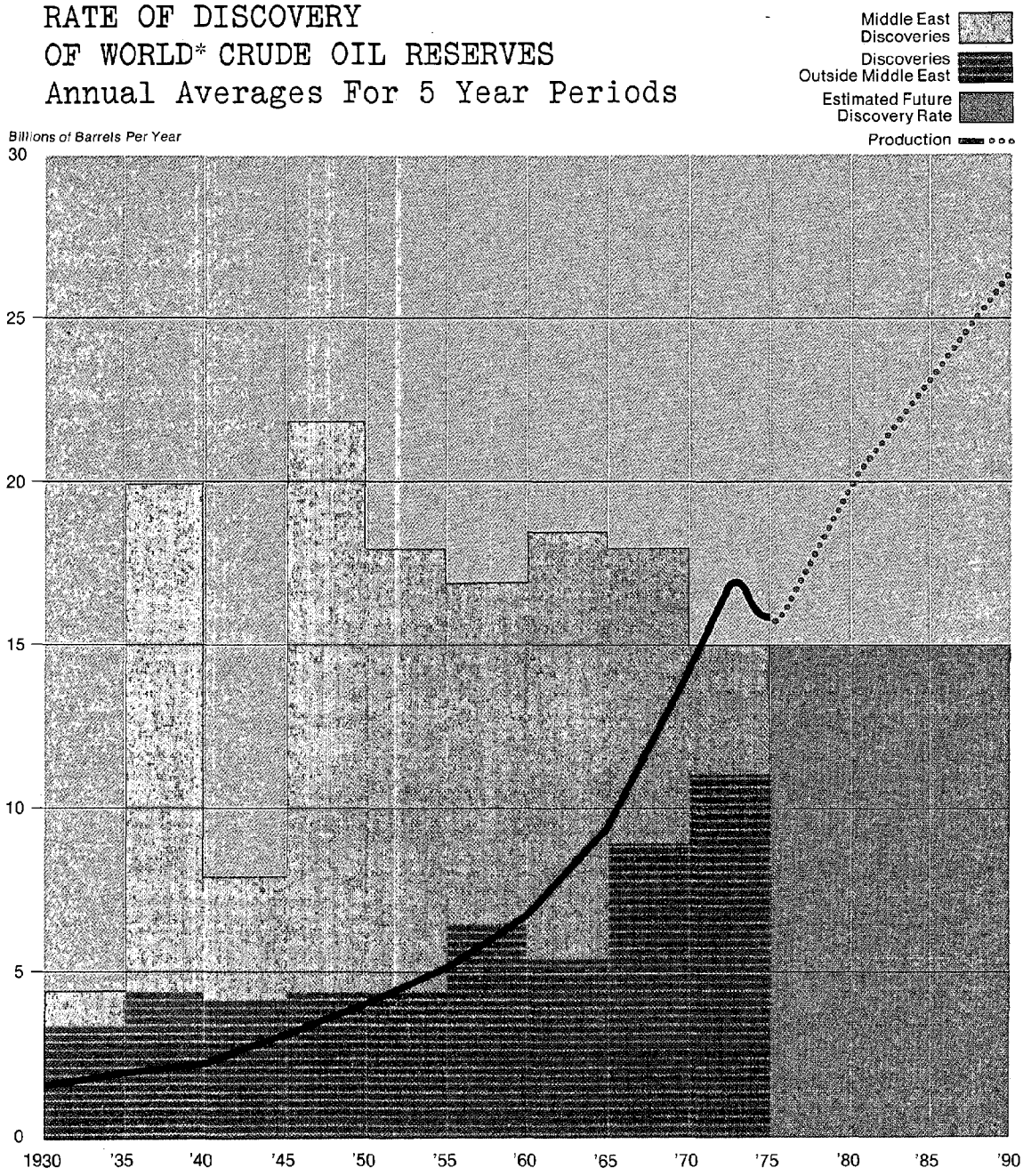
Determination of the total revenues accruing to the Middle East governments from oil has become quite complex. Participation means that the governments acquire an interest in the operation which normally carries rights to a proportionate share of the oil produced. To date they have been selling much of this oil back to the international oil companies while marketing a portion to their own customers. Thus, the countries' total oil revenues now consist of royalties, taxes and other payments made by the companies, plus what the governments make by selling their own oil.

By the end of 1975, the net effect of increases in tax and royalty rates, changes in posted prices and revenues from the sale of participation oil had increased the income of host governments of the region to approximately $11 per barrel. In 1973, that income had been about $2 per barrel, and early in 1970, it had been only about $1 per barrel. (See Chart 5) This precipitous price rise had a serious impact on the world's economy and created grave financial difficulties for lesser developed countries.

One result has been a worldwide reduction in petroleum consumption as oil users seek to minimize the impact of higher prices through conservation measures. Thus, for the first time in history, Middle East production levelled out in 1974 and declined in 1975. As world economies strengthen, output will undoubtedly rise again, but probably not as rapidly as might have been anticipated prior to the events of 1973-4. (See Chart 8)

CHART 9

RATE OF DISCOVERY OF WORLD* CRUDE OIL RESERVES Annual Averages For 5 Year Periods



Over the last several decades, oil has been discovered in the non-Communist world at an annual rate of 15-20 billion barrels. Most of this oil was found in the prolific fields of the Middle East. In the last two decades, the discovery rate outside the Middle East increased over earlier periods, reflecting increased exploration activity in other areas in pursuit of greater diversification of supply sources.

Prior to 1970, discoveries greatly exceeded production, and proved reserves were accumulated. By the mid-1970s, however, production had begun to exceed discoveries, and reserves had to be drawn down. It seems unlikely that the pace of discovery can be raised in the future beyond about 15 billion barrels per year.

At the same time, it is certain that production cannot exceed discoveries indefinitely. Consequently, there is a significant chance that world oil demand could be limited by the availability of supply starting in the late 1980s.

*EXCLUDING COMMUNIST AREAS

The discovery and production of oil have had a far-reaching and dramatic impact on economic and social conditions in the Middle East. Not only have the oil companies been responsible for dramatic changes in the immediate areas of their operations, but revenues from oil operations have provided the governments with the means for intensive national development programs.

For centuries, trade, animal husbandry and agriculture were almost the only means of livelihood in the Middle East. Industry was almost nonexistent. Governments and local business lacked capital to improve conditions. In 1932, for example, the total government income in Saudi Arabia was about $2.4 million, derived partly from customs duties and local taxes, but principally from a head tax collected from pilgrims to Mecca. Saudi Arabia's income from oil in 1975 was 10,000 times its total 1932 revenues. On a per capita basis, revenues of some of the smaller countries, such as Abu Dhabi and Qatar now exceed those of the most highly industrialized countries of the world.

When private oil companies entered the region, first to explore and later to build producing, shipping and refining facilities, they found local labor untrained in the trades required. The companies in those early years had to import all the skills and technology needed to carry on operations, while local workers received on-the-job training, and often were sent abroad for higher technical education.

Besides importing skilled workers, the operating companies had to establish service enterprises both to conduct their activities and to sustain the work force. They found themselves in the food supply business, the utility and refuse collection businesses, the hardware and clothing businesses, all based on massive imports. They provided communities with such services as roads, irrigation, health care, sanitation, schools, banking and housing. Over the decades, however, the oil companies began to divest themselves of these auxiliary services, as local economies expanded and government and local private enterprise could take over many of them for the benefit of the whole populace, as well as oil industry employees.

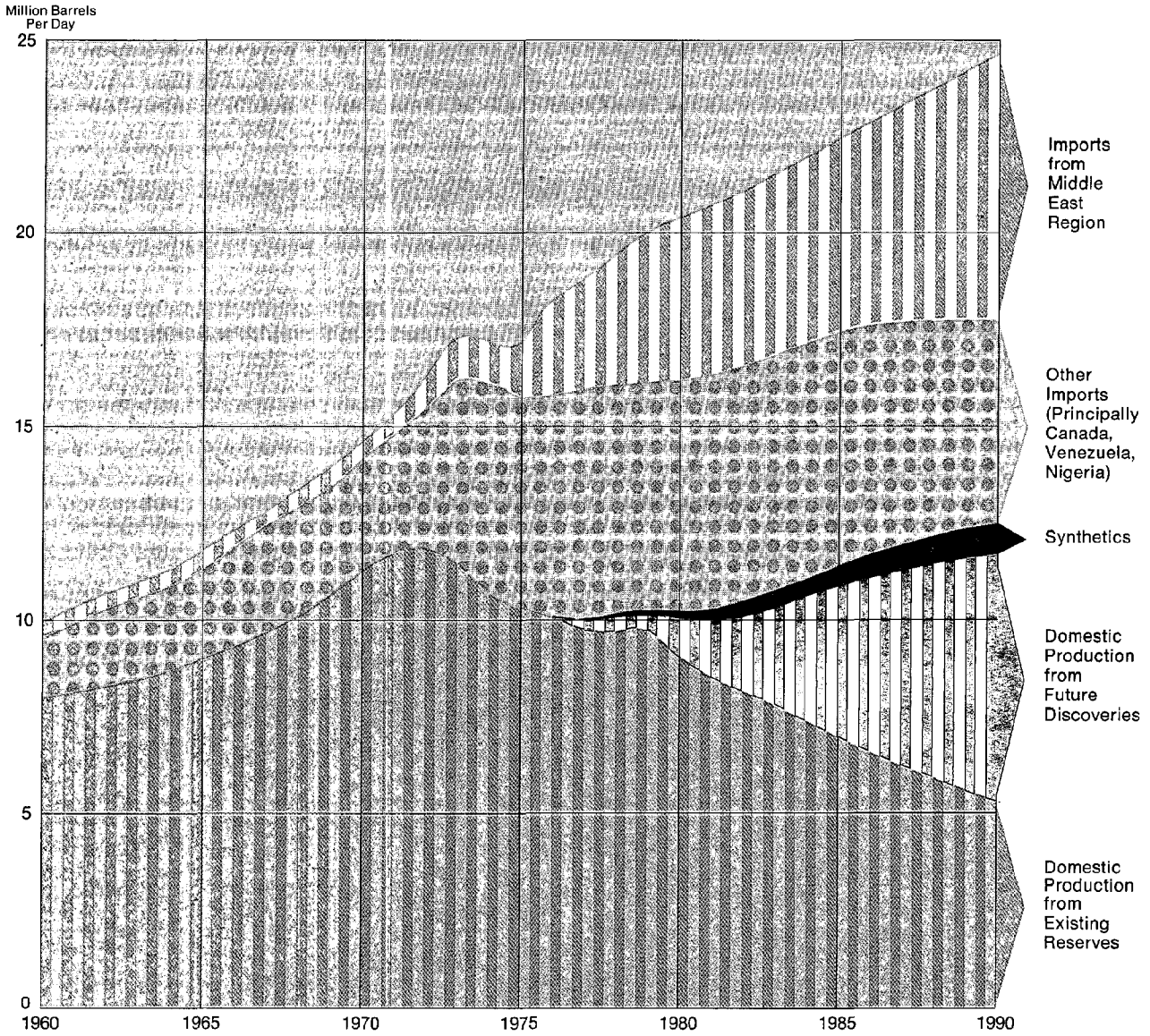
The governments have recognized that it is in the best interests of the region to use their oil revenues to build, to the fullest extent possible, strong, diversified economies that will support future generations. To this end, they have begun marshalling their huge, recently acquired financial resources to expand the needed infrastructure (roads, power systems, communications networks, fresh water supplies, etc.), as well as establishing large-scale agricultural and industrialization projects.

Changes in the economic conditions and quality of life in these countries brought about by development of their prime natural resource—petroleum—have been remarkably swift. The leaders of the area are pressing vigorously to expand and hasten economic and social progress, and the people of the area appear to be adapting to the rapid modernization taking place in their societies.

The role of the oil companies in the Middle East is still changing, and at this writing their future is uncertain. Nevertheless, Exxon, which has been in the Middle East for more than 50 years, expects to be there for years to come, exploring, operating fields, exporting oil, and providing technology and other services that will assist in the internal development of the region as well as assuring adequate supplies of petroleum to Exxon customers.

CHART 10

IMPORTS FROM THE MIDDLE EAST AND THEIR SIGNIFICANCE TO UNITED STATES OIL SUPPLY – HISTORY AND OUTLOOK



U.S. Oil Supply As the most versatile and the most readily available energy source, only oil is capable of taking up the slack created by the shortfall of any other fuel. Consequently, slower-than-forecast growth in coal, nuclear, or gas would rapidly translate into additional oil imports.

Domestic oil supply leveled off in the early 1970's and is now declining. This decline is likely to continue until late 1977 when North Slope oil will begin moving through the trans-Alaska pipeline. North Slope production will reach 2.0 million barrels per day in the mid-80's. Over half of 1990 domestic oil production must come from reserves yet to be discovered. Most of these new discoveries must come from "frontier" areas of Alaska and the Outer Continental Shelf. Leadtimes between initial exploration and peak production in some of these frontier areas may be longer than ten years.

Synthetic Oil Oil from shale and coal will not become commercially available for several years. By 1990 combined synthetics liquids production from these sources is expected to be 0.7 million barrels per day and will account for about 3% of total oil supply.

Imports Over the forecast period, U.S. oil demand will grow much more rapidly than domestic oil supply. Consequently, the U.S. will require increasing quantities of imports to fill the gap between domestic supply and demand. Oil imports are forecast to increase from 44% of total oil supply in 1976 to about 50% of supply by 1980, then maintain about this share through 1990.

Total U.S. Oil Supply (million barrels/day)

	1960	1976	1980	1990
Domestic (conventional)	8.2	10.3	10.0	11.8
Domestic (synthetic)				
Oil Shale	—	—	—	0.5
Coal	—	—	—	0.2
Imports	1.8	8.0	10.5	12.2
TOTAL	10.0	18.3	20.5	24.7

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